

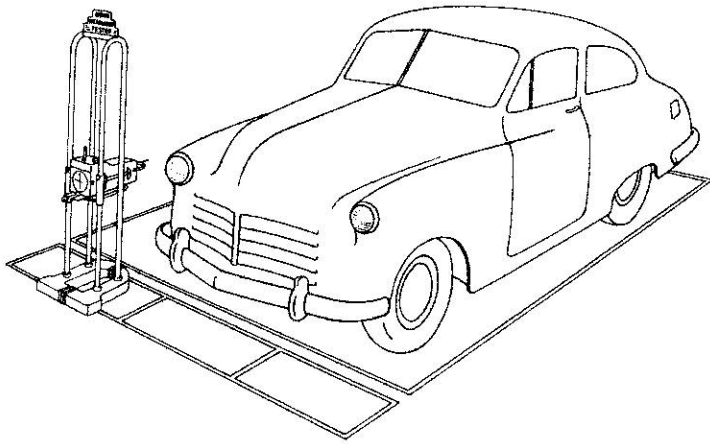
**OPERATING
INSTRUCTIONS**



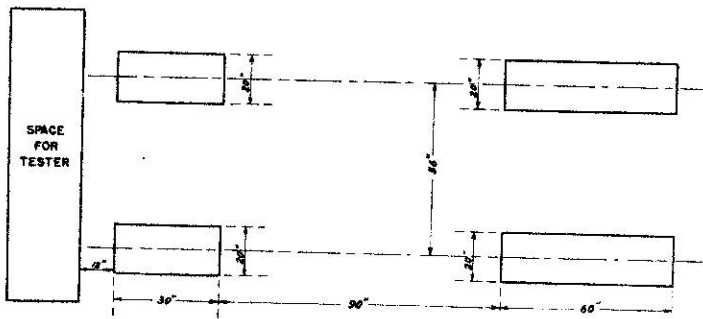
Headlight Tester

MODEL 560 and MODEL 561

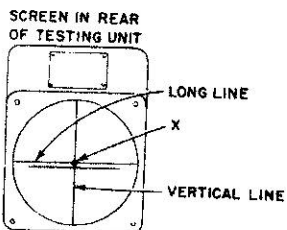
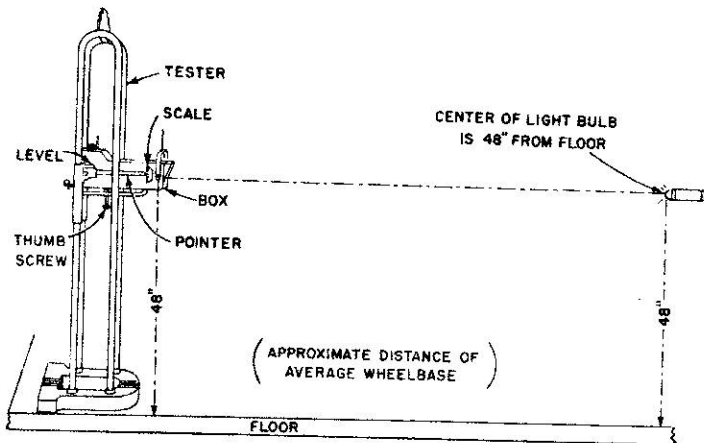
PREPARATION FOR HEADLIGHT DEPARTMENT



View showing car in proper location for testing headlights, when using track type tester.



Plan for leveling floor when track type tester is used.



LOCATION

Pick out a location that is convenient for getting the cars in and out. Since appearance and showmanship make a good impression on your customers, we recommend that the location picked for headlight testing be painted up in bright, attractive colors. In addition, it pays to build a small tool board and cabinet for tools and equipment used in the repairing and adjusting of headlamps.

Another good idea frequently employed involves placing a small awning, which harmonizes with the colors that you paint the headlight testing space, above the department.

SETTING TESTER TO SLOPE OF FLOOR

The location for headlight testing should be reasonably level and in case there is a slope to the floor, the Bear headlight tester must be adjusted to this slope.

Place headlight tester box and light bulb 48" from floor, as shown in diagram. Set pointer on side of testing unit at zero. Move box right or left and with thumb screw raise or lower box until horizontal line (long line) and vertical line cut hot spot of light, X, into four equal parts. Take hold of end of pointer and raise or lower pointer until level shows level. The reading on side scale will give the correct slope of the floor.

Since the track-type tester will always be operated in the same location, if zero mark on side scale does not line up with pointer, loosen the retaining screw and set scale so zero mark lines up with pointer when bubble is level.

On portable type tester, the testing unit must be set to slope of floor for location where tester is being used.

PREPARATION FOR TESTING

The vehicle should be unloaded of all "extras" so that it is setting normal. Tires must be properly inflated. Bounce front end to normalize springs.

Clean headlamp lens and check make of headlamp. This can usually be found imprinted on the lens. If not, look on the headlamp body proper.

Determine what your State Requirements are (if any) and if they are different than those recommended by the headlamp manufacturer, follow the State Requirements.

We have reproduced in this manual the headlamp patterns as recommended by the Automobile Manufacturers Association, American Standards Association, and the Society of Automotive Engineers. These patterns show just how the image would appear on the Bear Headlight Tester screen. If the beam is symmetric, the image will be "straight ahead." If the beam is asymmetric, it will be to the left or right, determined entirely by the make of headlamp and car manufacturer's recommendation. For checking the degrees or inches of the asymmetric beams, refer to the chart included in this manual.

Turn on headlights. Be sure switch is on upper beam.

OPERATING INSTRUCTIONS FOR PORTABLE MODEL 560



Figure 1

Place the headlight tester as squarely as possible in front of the headlamp, as shown in Fig. 1. Have rear of testing unit approximately in the middle between the two uprights. With focal pointer, A, Fig. 1, down, adjust position of testing unit so pointer is in the center of headlamp lens.

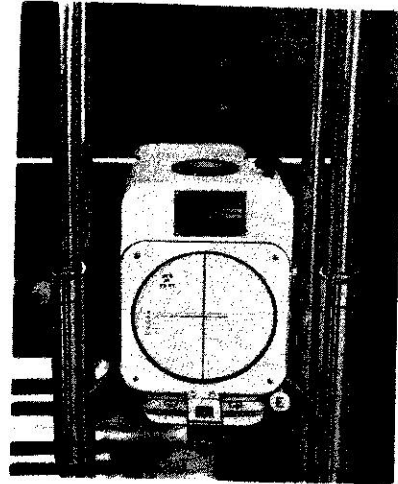


Figure 3

For all lamps to be aimed straight ahead, such as sealed beam, adjust lateral aim scale, E, Fig. 3, until zero on scale is directly under hair-line in center of handle. For headlamps requiring aiming to right or left, set lateral aim scale on reading required.

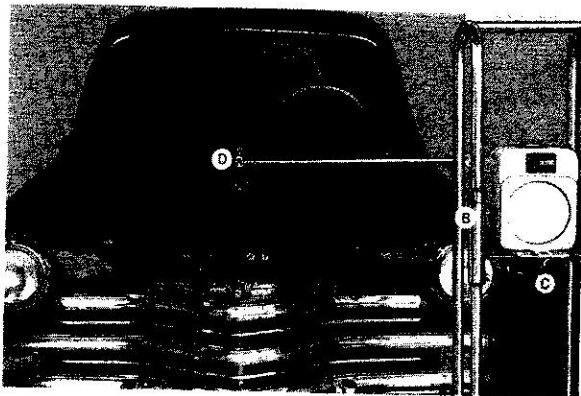


Figure 2

Grasp grip lock, B, Fig. 2, and raise testing unit so top of testing unit is slightly above hood level. Adjust telescoping sight tube to center line of car. Use handle, C, Fig. 2, to move testing unit laterally until the two pointers in sight bar, D, Fig. 2, are in line with the center line of car. In case hood does not have center line, determine center line by using hood emblem, center of windshield, and center of rear window.

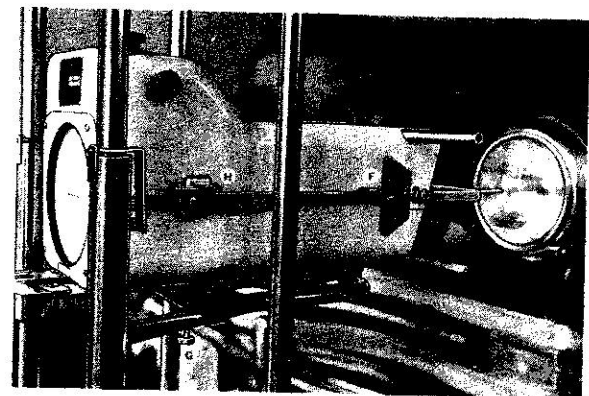


Figure 4

Using grip lock, lower testing unit until focal pointer is again directly in the center of headlamp lens. Set pointer, F, Fig. 4, to predetermined slope of floor, as outlined in instruction "setting tester to slope of floor." By means of adjusting screw, G, Fig. 4, raise or lower testing unit until level, H, Fig. 4, shows level. This indicates that the horizontal line (long line) on screen is at the same height or on the same plane as the center of the headlamp lens. Raise focal pointer.

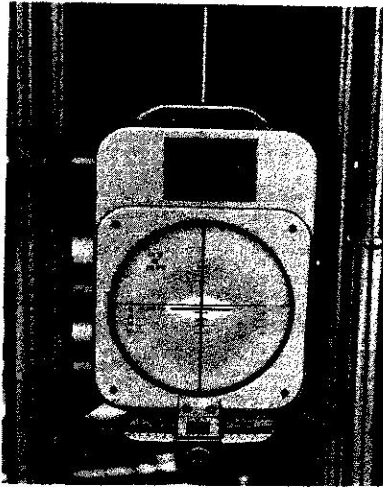


Figure 5

Check visually beam pattern on tester screen. Figure 5 shows beam pattern on sealed beam lamp. Note lateral aim scale set on zero for aiming straight ahead. Beam pattern is aimed correctly when hot spot is centered sideways on vertical line and centered up and down on heavy, short horizontal line denoting 3" drop in 25 feet.

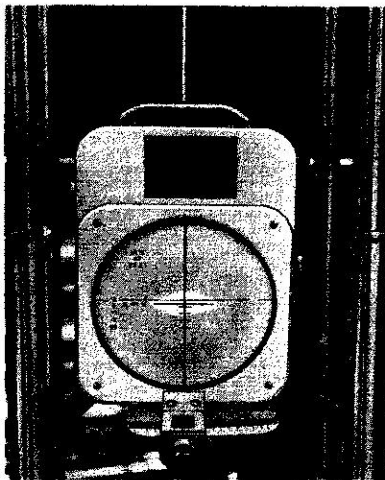


Figure 6

For other makes of lamps check headlamp pattern per diagrams reproduced on the following pages. Figure 6 shows lateral aim scale set $2\frac{1}{2}$ degrees to the right for headlamp that requires this setting.

Center of beam pattern is accurately determined by photo-electric cell. Photo-electric cell is adjusted vertically by turning vertical control, I, Fig. 7, and laterally by turning lateral control, J, Fig. 7.

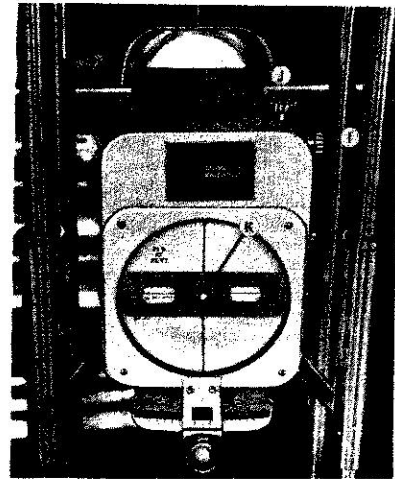


Figure 7

Adjust cell vertically and laterally until maximum meter reading is obtained. At maximum reading light projected through center of photo-electric cell, K, Fig. 7, shows center of beam pattern on screen.

In adjusting cell laterally or vertically to get maximum reading, watch meter and projected ray on screen. As meter reading may remain constant over a small area near center of beam pattern, check extremes of ray movement at constant reading and set at half-way position.

With lateral aim scale on zero and testing unit level, sealed beam lamp is aimed correctly when projected ray centers on vertical and heavy short horizontal lines, Fig. 7.

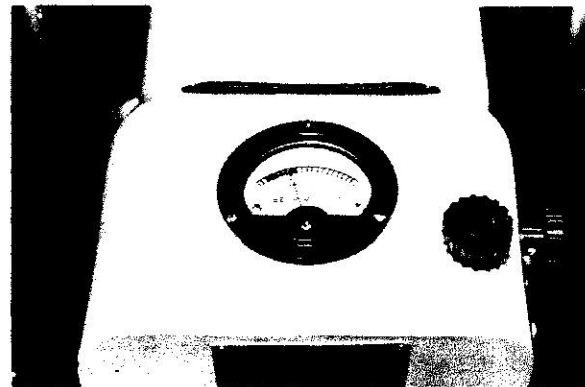


Figure 8

Maximum meter reading shows light output. Meter reads in thousands of beam candlepower. Follow the same procedure for checking the other headlamp.

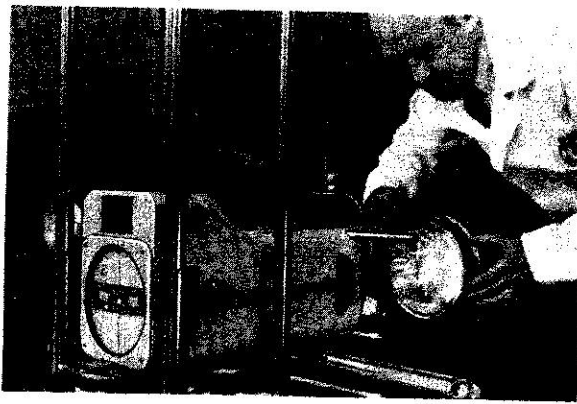


Figure 9

Headlamp can be adjusted either visually or electrically. Testing unit must be correct for lateral aim and elevation when adjusting the same as when testing headlamp.

To adjust headlamp visually, raise cell with vertical control until cell is at top of its travel. Operator can then view beam pattern on inside of screen and observe changes as lens is adjusted, Fig. 9.

To adjust headlamp electrically, set photo-electric cell so that projected ray on screen is at correct setting for beam elevation and lateral aim. Adjust headlamp first vertically, and then horizontally until meter indicates the maximum reading obtainable, Fig. 9. Lamp is then correctly aimed.

OPERATING INSTRUCTIONS FOR TRACK MODEL 561

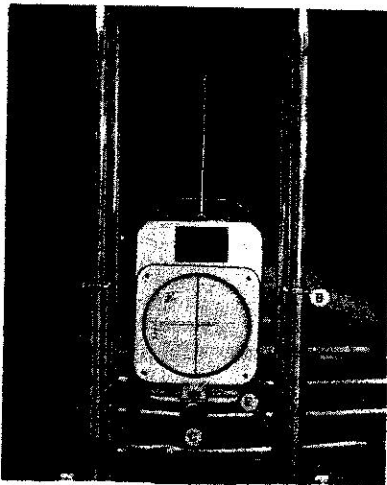


Figure 10

Have tester adjusted to slope of floor, as outlined on Page 1. Place vehicle in position as squarely as possible to headlight tester. Move tester to center of vehicle. Grasp grip lock, B, Fig. 10, and raise testing unit so top of unit is slightly above hood level. Use handle, C, Fig. 10, to move testing unit laterally until the focal pointer and rear sight are in line with the center line of vehicle, as shown in Figure 10. In case hood does not have center line, determine center line by using hood emblem, center of windshield and center of rear window.

For all lamps to be aimed straight ahead, such as sealed beam, adjust lateral aim scale, E, Fig. 10, until zero on scale is directly under hairline in center of handle. For headlamps requiring aiming to right or left, set lateral aim scale on reading required.

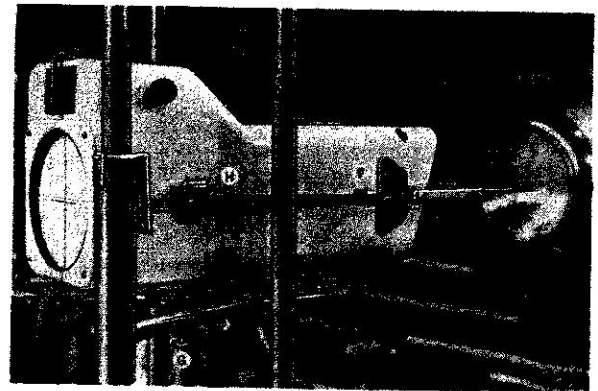


Figure 11

Move tester to first headlamp to be tested and lower focal pointer. With grip lock, lower testing unit and adjust forward or backward until focal pointer is directly in the center of the headlamp lens. Set pointer, F, Fig. 11, to zero, and by means of adjusting screw, G, Fig. 11, raise or lower testing unit until level, H, Fig. 11, shows level. This indicates that the horizontal line (long line) on screen is at the same height or on the same plane as the center of the headlamp lens. Raise focal pointer.

Except for lining up track type Model 561 with the car, all operating instructions are the same as for the portable Model 560. Proceed with operating instructions, Figure 5 to Figure 9, inclusive.

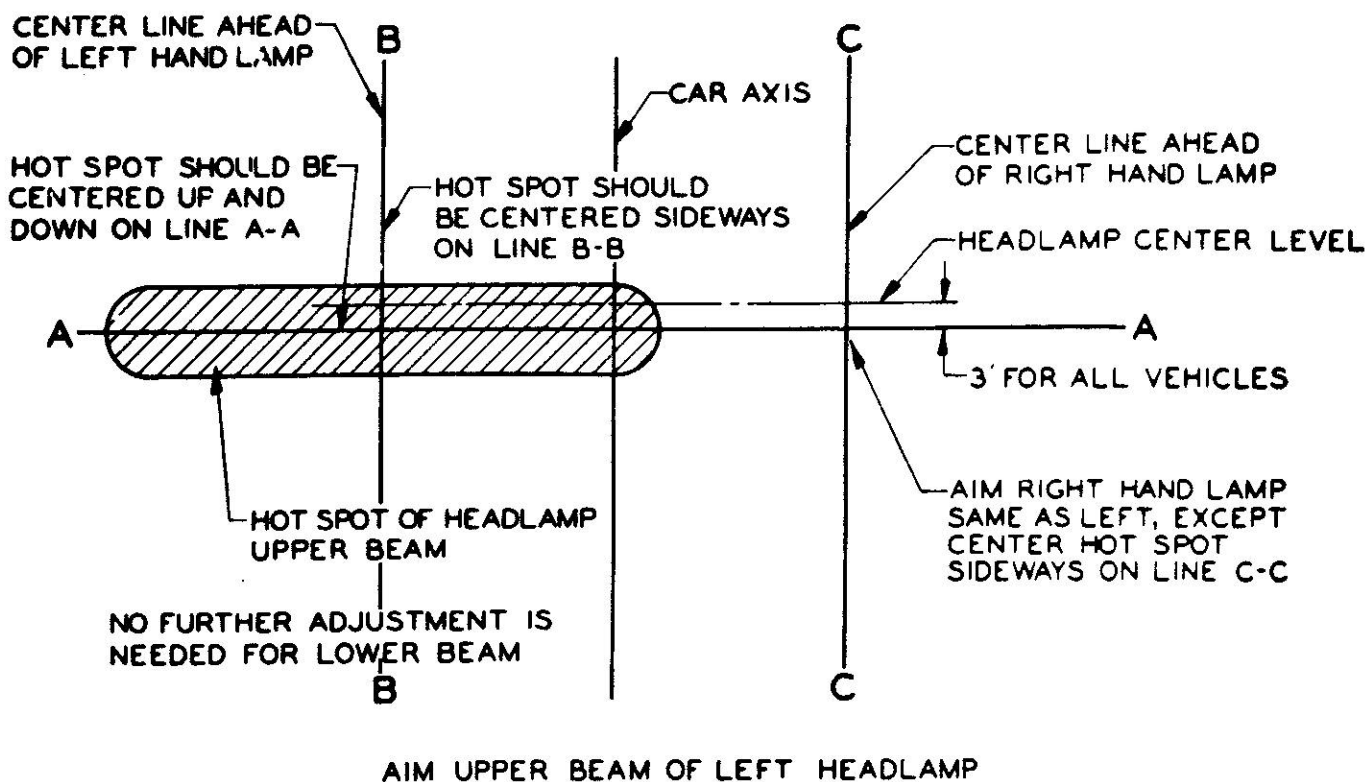
To check lamp on other side it is not necessary to re-aim tester. Move tester in front of lamp, check lateral aim scale and elevation scale to make sure they are on zero and proceed with test.

MANUFACTURERS HEADLAMP AIMING INSTRUCTIONS

NOTE: Vertical and horizontal centerlines shown are identical to those on the Bear Tester Screen.

The same applies to the 3" below lamp center line.

"SEALED BEAM" HEADLAMP AIMING INSTRUCTIONS

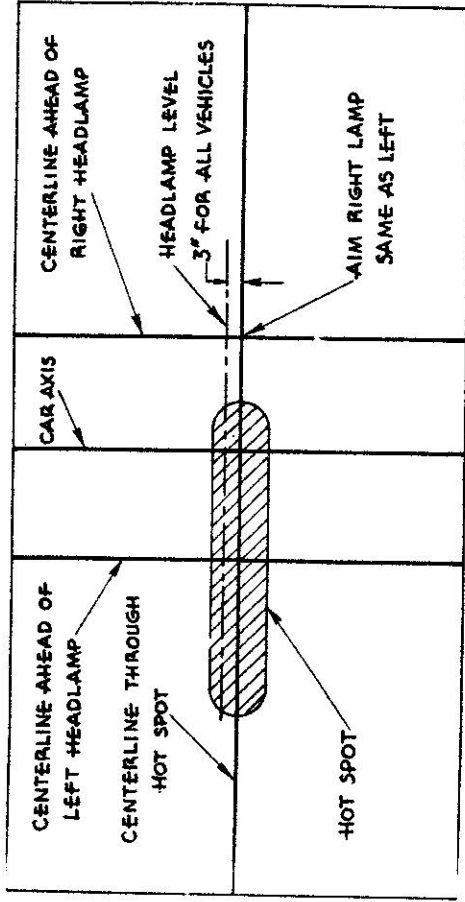


All beam patterns herewith reproduced by permission of the Automobile Manufacturers Association.

CONTROL BEAM, GLOWLITE, PARABEAM, STABILITE, TILTRAY, TWILITE, TWOLITE HEADLAMPS

TWO-BEAM

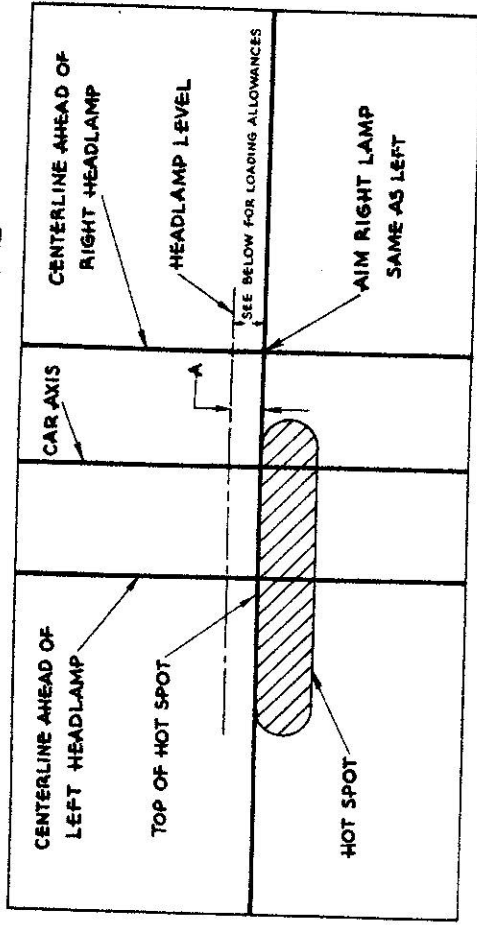
BOTH LAMPS - SYMMETRICAL



GUIDE RAY HEADLAMPS

SINGLE-BEAM

BOTH LAMPS - SYMMETRICAL



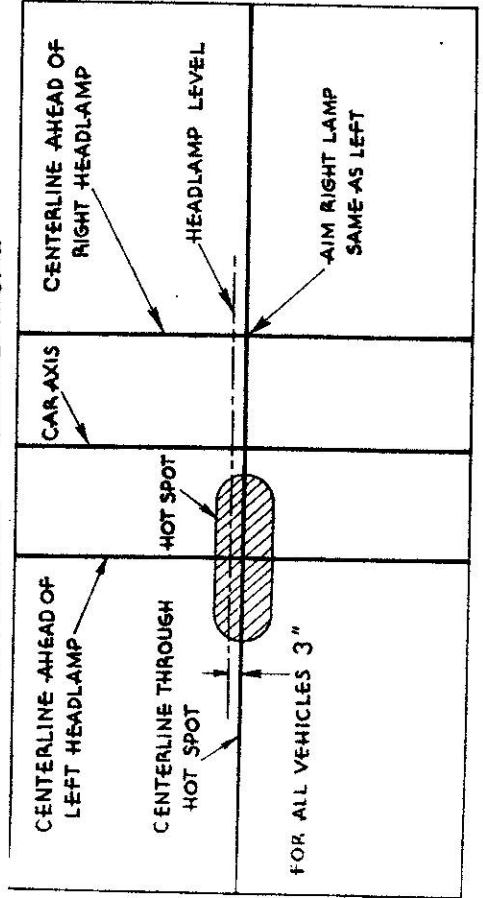
LOADING—ALLOWANCE SCHEDULE

American Standards and S.A.E. specify dimension A to be 5" for all single beam lamps with vehicle unloaded.

BI-RAY & RITE WAY HEADLAMPS

TWO-BEAM

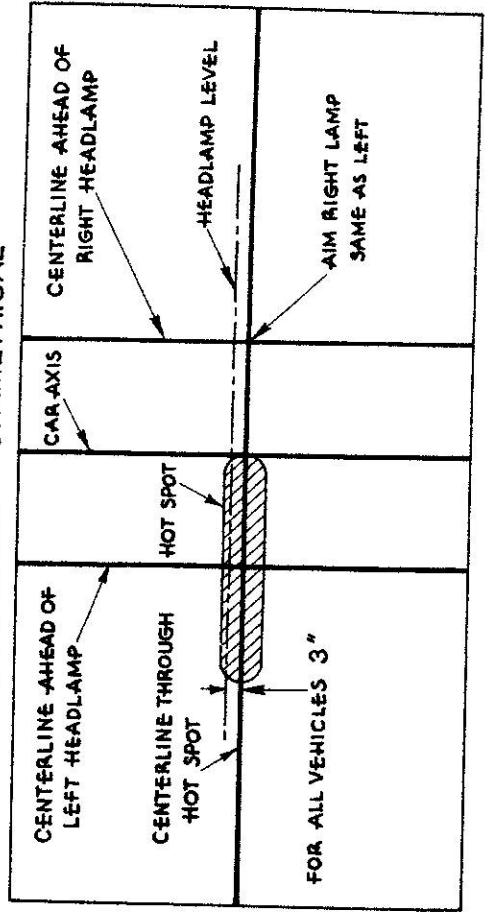
BOTH LAMPS - SYMMETRICAL



DEPRESS BEAM HEADLAMPS

TWO-BEAM

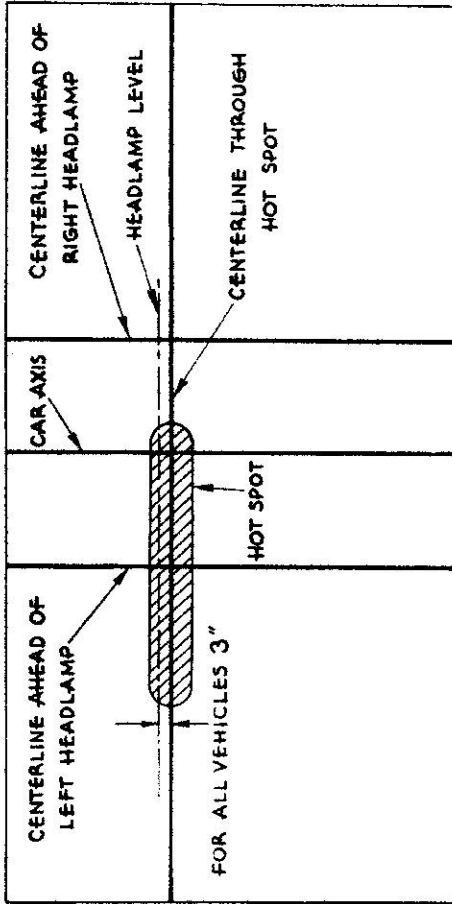
BOTH LAMPS - SYMMETRICAL



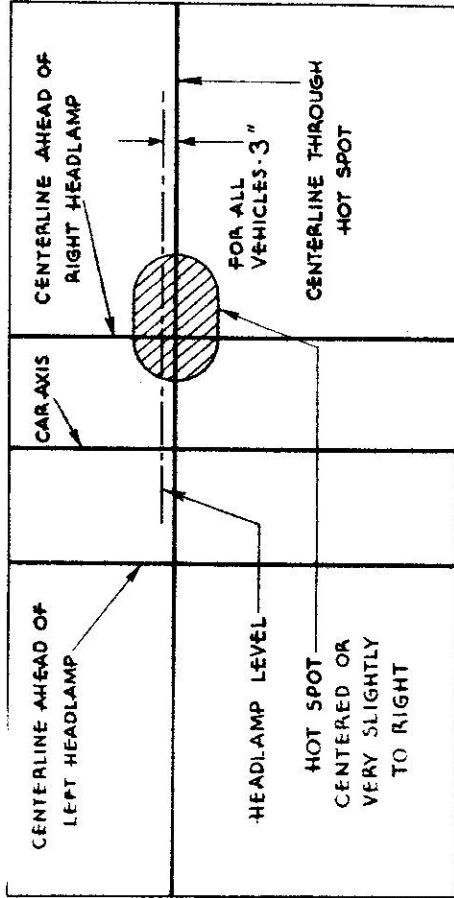
SOLAR HEADLAMPS

THREE-BEAM

LEFT LAMP - SYMMETRICAL



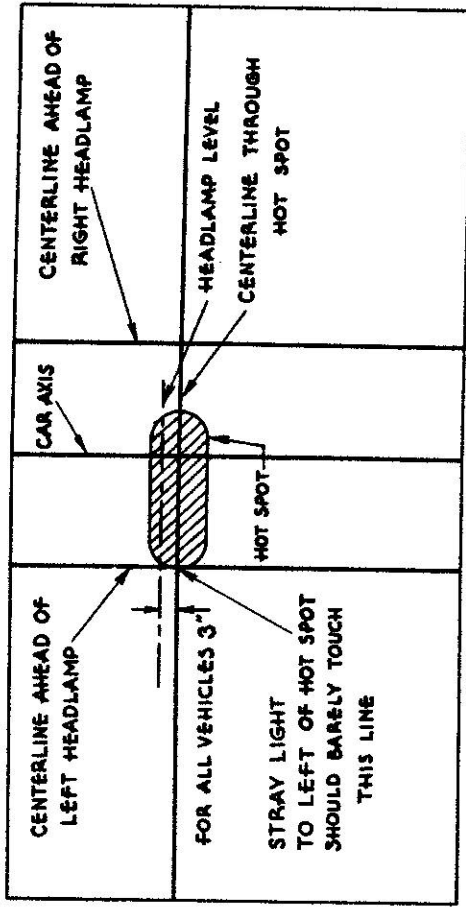
RIGHT LAMP - ASYMMETRIC TO RIGHT



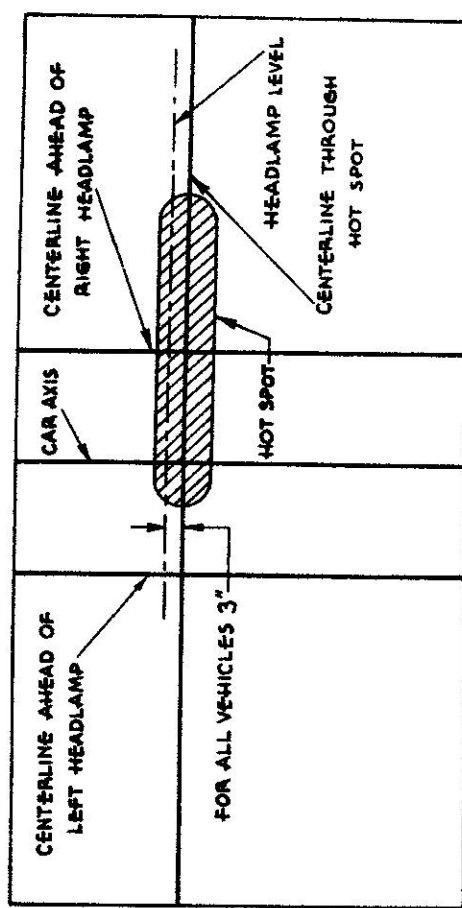
SUPERSAFE HEADLAMPS

FOUR-BEAM

LEFT LAMP - ASYMMETRIC TO RIGHT



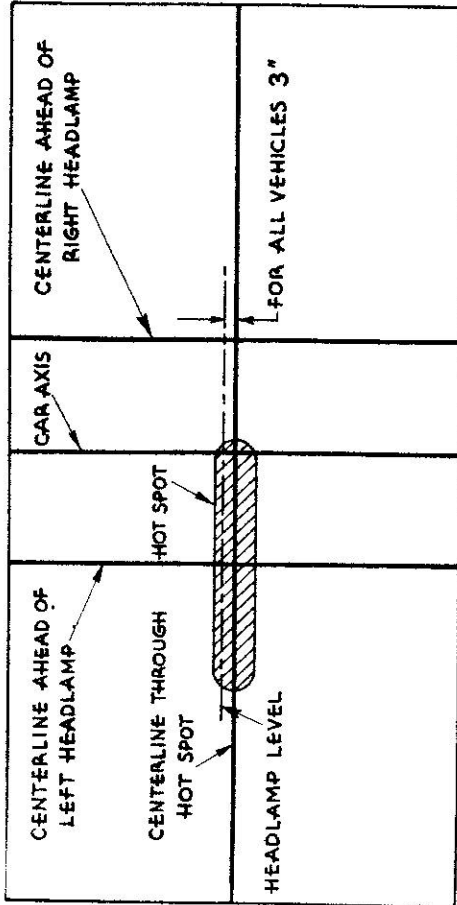
RIGHT LAMP - SYMMETRICAL



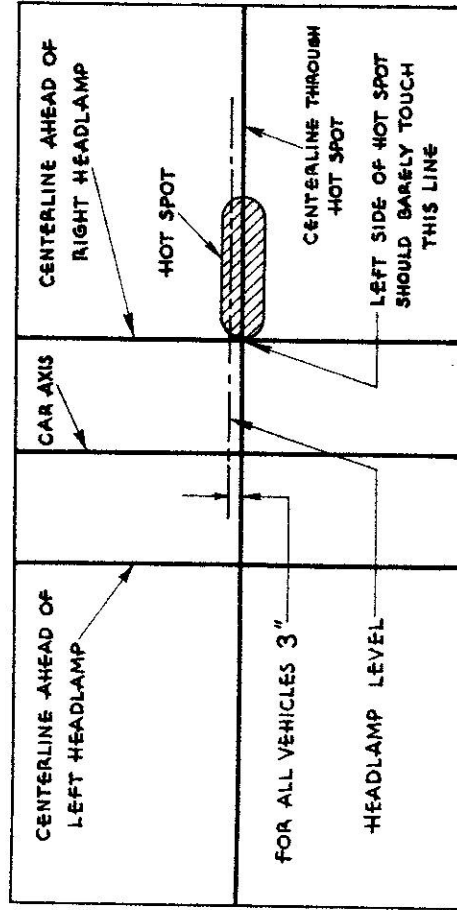
FLEXBEAM HEADLAMPS

THREE - BEAM

LEFT LAMP - SYMMETRICAL



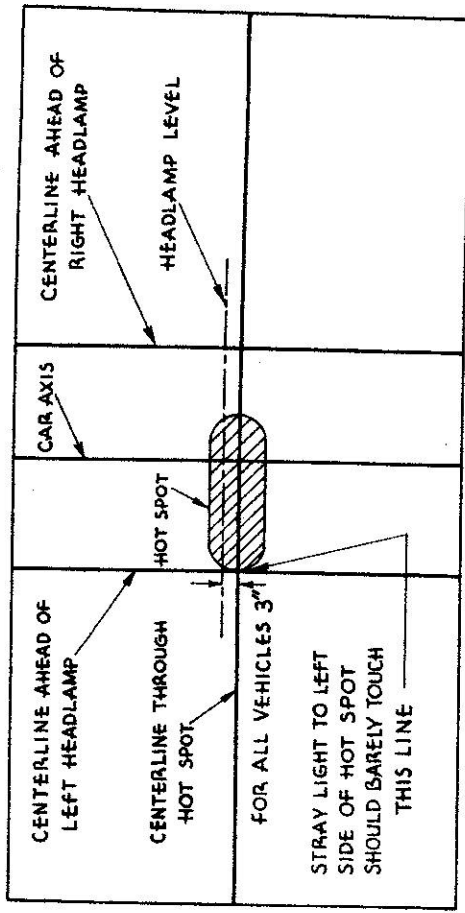
RIGHT LAMP - ASYMMETRIC TO RIGHT



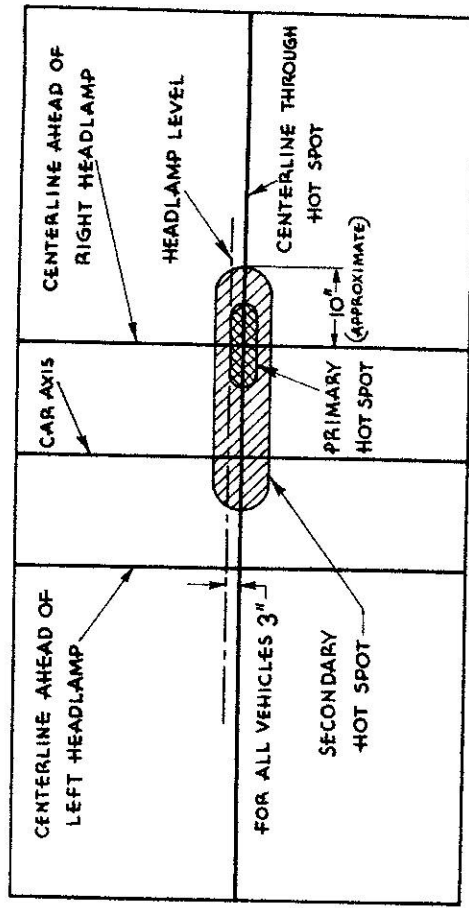
MULTIBEAM & TRIBEM HEADLAMPS

THREE - BEAM

LEFT LAMP - ASYMMETRIC TO RIGHT



RIGHT LAMP - SEMI-ASYMMETRIC TO LEFT



LATERAL AIM TABLE

Below are listed lateral aim recommendations for setting the headlamp beams on various makes of motor vehicles. These specifications are given only in inches to simplify the settings. Should your State requirements or manufacturers recommendations be given in degrees, the inner scale on the lateral aim dial can be used. All figures are based on a 25 foot distance from the lamp center, straight ahead of the lamp, the same as the headlight tester calibration.

When aiming the headlight beam, the figures below indicate that the center of the hot spot is either straight ahead, to the right, or to the left of the straight ahead center of the headlamp, according to specifications.

NAME OF LAMP	LATERAL AIM OF BEAM. LEFT OR RIGHT OF STRAIGHT AHEAD	
	LEFT LAMP	RIGHT LAMP
BiRay	0	0
Booster Beam	0	0
Control Beam	0	0
Depress Beam	0	0
FlexBeam	0	13"R
Guide Ray	0	0
Monogram	0	0
Multibeam	13"R	0
Riteway	0	0
Sealed Beam	0	0
Solar	0	13"R
Stabilite	0	0
Super-Safe	13"R	0
TiltRay	0	0
Tribeam	13"R	0
Twilite	0	0
Twolite	0	0

SERVICE AND MAINTENANCE

REMOVAL OF INSPECTION PLATE

Access to inside of testing unit can be had by removal of inspection plate on top of unit. Push plate slightly toward screen end of unit, lift up front edge of plate and slide forward toward lens end of unit until plate is free.

REPLACEMENT OF LENS OR SCREEN

If lens or screen is replaced for any reason, alignment of tester should be checked with light bulb by following directions as outlined for setting tester to slope of floor, see Page 1.

REMOVAL OF SCREEN ASSEMBLY

Take off lateral aim scale. With screw driver lift short chrome trim strip on right side of unit and remove strip. Lift chrome trim strip on left side until end clip is free. Remove two sheet metal screws on under side of unit. Use handle to pull screw assembly out at bottom until released from retaining clip at top of assembly.

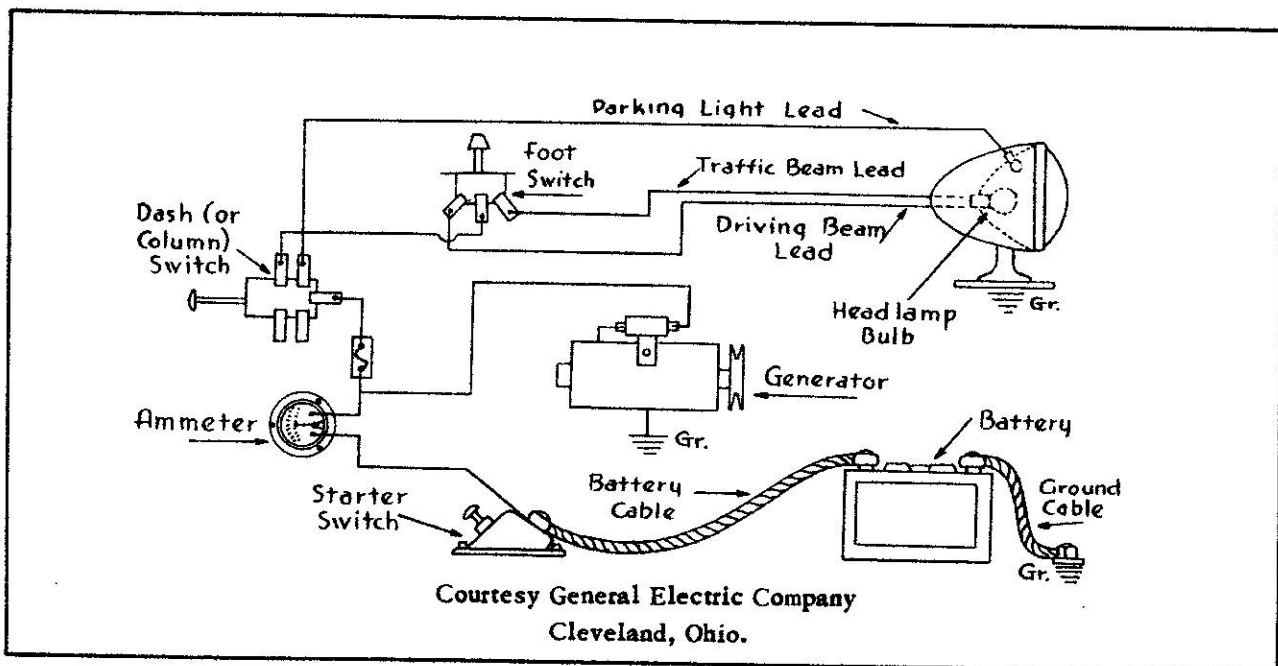
CLEANING LENS

Inside of lens should be kept free from film and dust. Remove inspection plate and clean lens with soft cloth.

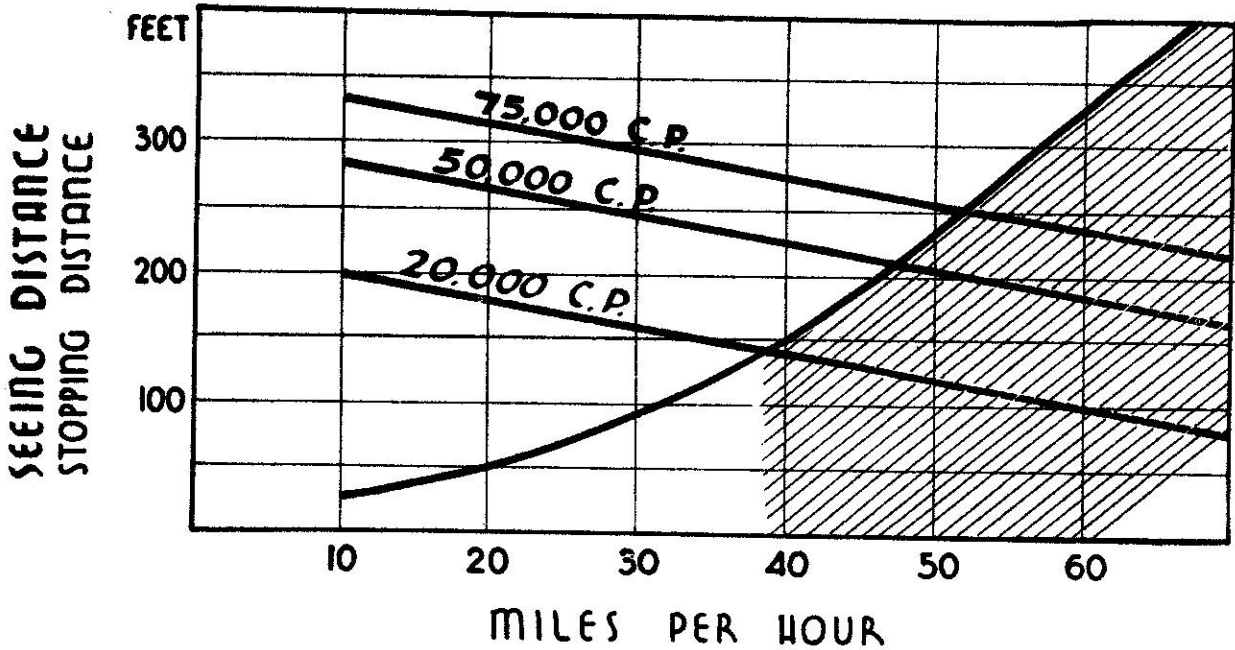
LOW VOLTAGE CAUSES DIM LIGHTS

Figure below illustrates typical wiring diagram. In many instances low voltage occurs, as a result of poor connections, wire too small to carry current, or other faults in the circuit. It is recommended that a "jumper lead" be used to test out the circuit. If, when connecting from battery direct to the lamp, the lights

brighten up, then test each part of entire circuit for voltage loss. In addition to repairing this trouble, it is advisable to check voltage at the battery, battery ground connections, make a relay installation, clean the reflectors if necessary, and replace bad bulbs and gaskets. Then re-aim lights for proper road visibility.



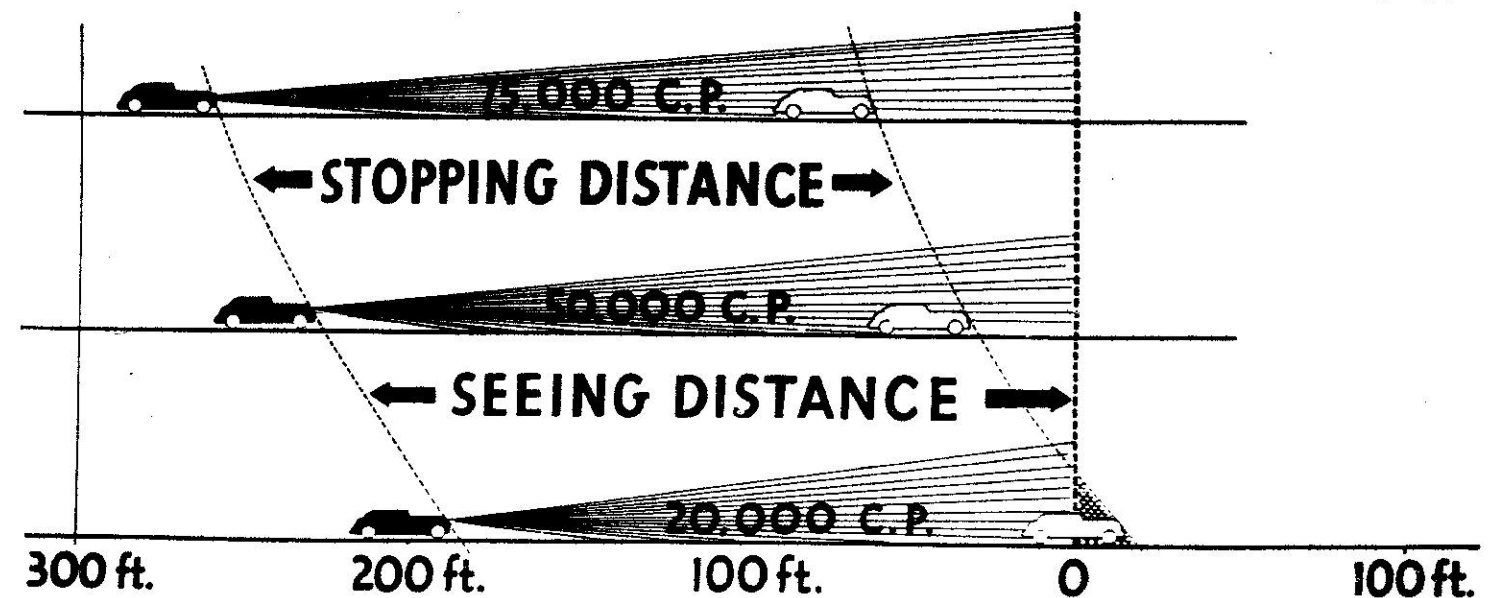
STOPPING AND SEEING DISTANCE AS AFFECTED BY SPEED



TESTS INDICATE: NORMAL DRIVING CONDITIONS, UNDER ORDINARY CIRCUMSTANCES; WITH AVERAGE BRAKES; WITH AVERAGE INDIVIDUAL, IN DARK CLOTHING.

Courtesy of General Electric Company, Cleveland, Ohio.

RELATION OF SEEING DISTANCE TO STOPPING DISTANCE AT 45 MPH



TESTS MADE WITH MAN-SIZED OBSTACLE IN DARK CLOTHING; NORMAL DRIVING CONDITIONS

STOPPING DISTANCE: ORDINARY CIRCUMSTANCES AVERAGE BRAKES (NATIONAL SAFETY COUNCIL)